

REMARKS/ARGUMENTS

Please reconsider the application in view of the above amendments and the following remarks. Claims 1 to 20 remain in this application. Applicants have amended paragraph 0001 of the specification and the drawings in response to the objections of the examiner.

Information Disclosure Statement:

The examiner has objected to the Information Disclosure Statement filed 12th December 2003 as failing to comply with 37 CFR 1.98 (a) (2), which requires a legible copy of each foreign patent document to be filed. The applicant herewith files a copy of the Information Disclosure Statement with copies of each of the foreign patent documents attached. The applicant asks that the Examiner acknowledge that the information contained therein has been considered.

Drawings

The Examiner objected to the drawings as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign mentioned in the description: 215.” Applicants have amended Figure 2B of the specification to include the reference number 205 rather than 215, 205 appears in the description. No new matter has been added by way of this amendment. Applicants respectfully submit that this amendment obviates the objection.

Specification

The Examiner objected to the abstract as being a single run-on sentence. Applicant has amended the abstract to form a clear sentence. Applicant believes this amendment obviates the objection.

Rejection(s) under 35 U.S.C § 102 - Hahn

Claims 1, 2, 4, 7, 14, 15 and 17-20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Hahn et al. (US 6,419,003). This rejection is respectfully traversed.

Claim 1 of the current application recites a directional casing drilling system, which comprises: a casing string; a mud motor operatively coupled to the casing string; a rotary steerable system which is operatively coupled to the mud motor; and a drill bit which is operatively coupled to the rotary steerable system. Hahn et al does not teach the limitation of claim 1. The Office Action suggests that Hahn teaches a mud motor 149 operatively coupled to a casing string 112. While 112 is indeed a casing, it is merely provided at an upper portion of the wellbore 110 and is separated from the mud motor by a lower section 114, the lower section 114 is of a smaller diameter than the casing 112. The casing can, therefore, not be said to operatively coupled to the mud motor, it is, in fact, separated by, up to, many thousands of feet of lower section 114. (*See column 3 lines 1 to 5*). Therefore Hahn et al fails to teach the limitations of Claim 1 of the current invention and is distinguishable for at least this reason.

Claim 14 of the current application recites: a method of directional drilling comprising rotating a casing string at a first speed that is slower than an optimum drilling speed; operating a mud motor to rotate a drill bit at a second speed; and changing the direction of the drill bit by operating a rotary steerable system. The cited art fails to teach all the limitations of claim 14.

Hahn et al does not teach the limitation of claim 14. The office action suggests that the drilling string is rotated at a first speed. Hahn et al does disclose the rotation of the drillstring. However the applicant refers to arguments above relating to the separation between the casing 112 and the remainder of the assembly, it is thus not clear and inherent from Hahn et al that the casing 112 is rotated at the defined speed nor is it inherently taught that the speed is slower than an optimum drilling speed.

The Examiner further suggests that the “casing” would inherently rotate at a speed slower than that of the mud motor due to friction imparted on the “casing”. This is speculation on the part of the examiner and not inherently taught by Hahn et al where no mention is made of the relative speeds of the integers. Therefore, Hahn et al fails to teach the limitations of Claim 14 of the current invention and is distinguishable for at least this reason.

Claim 15 of the current application is dependent upon claim 14 and the applicant therefore submits that it is distinguishable over Hahn et al for at least the reasons given in the paragraph relating to claim 14 above. In addition Claim 15 adds the further limitation that the method further comprises enlarging a pilot hole drilled by the drill bit using an underreamer coupled to the casing string. Hahn teaches that the underreamer 132 is attached at a distance from the casing 112 and therefore could not be said to be coupled to the casing string. Therefore Hahn et al fails to teach the limitations of Claim 15 of the current invention and is distinguishable for at least this reason.

Claim 17 of the current application is dependent upon claim 14 and the applicant therefore submits that it is distinguishable over Hahn et al for at least the reasons given in the paragraph relating to claim 14 above.

Claim 18 of the current application recites the limitation of providing a method of directional casing drilling, comprising: positioning a casing string so that a bend in a lower section of the casing string points in a desired azimuthal direction; and engaging a mud motor to rotate a drill bit. Hahn et al teaches altering the drilling direction by means of activating the steering devices. Column 4 line 47. However Hahn et al does not suggest that the casing string 112 is positioned such that a bend in a lower section points in a desired azimuthal direction. Therefore Hahn et al fails to teach the limitations of Claim 18 of the current invention and is distinguishable for at least this reason.

Claims 19 and 20 are dependent upon claim 17 and therefore incorporate the limitations of that claim. Claims 19 and 20 are thus distinguishable over Hahn et al for at least the reasons given in the paragraphs relating to claim 18 above.

Rejection(s) under 35 U.S.C § 102 - Chen

Claims 1-3,5-9,11-16 and 18 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Chen et al. (US 6,877,570). This rejection is respectfully traversed.

Claim 1 recites a directional casing drilling system, which comprises: a casing string; a mud motor operatively coupled to the casing string; a rotary steerable system which is operatively coupled to the mud motor; and a drill bit which is operatively coupled to the rotary steerable system. Chen does not teach the limitation of the current claim 1. The office action suggests that Chen teaches a casing string 12 with a mud motor 14 operatively coupled to the casing string. It also suggests that a rotary steerable system 26 is provided operatively coupled to the mud motor. 26 is, in fact, a lower bearing section. *See column 3 line 33 and column 3 line 47. Column 3, line 47 reads:* "The lower bearing section 26 includes a bearing package

assembly which conventionally comprises both thrust and radial bearings.” This cannot be considered to be a rotary steerable system as claimed in the current claim 1 and claims dependent therefrom. Therefore, Chen et al fails to teach the limitations of Claim 1 of the current invention and is distinguishable for at least this reason.

Claims 2, 3 and 5-7 are dependent upon claim 1 and therefore incorporate the limitations of that claim. Claims 2, 3 and 5-7 are thus distinguishable over Chen et al for at least the reasons given in the paragraphs relating to claim 1 above.

Claim 8 recites the following limitations: a directional casing drilling system comprising a casing string having an integral bend proximate a lower end of the casing string; a mud motor operatively coupled to the casing string; and a drill bit operatively coupled to the mud motor. Chen et al fails to teach the limitations of claim 8 of the current invention and is distinguishable for at least this reason.

The office action states that Chen et al teaches a casing string 12 having an integral bend proximate a lower end thereof and refers to column 3 lines 10 to 12. However this lines refer to *“a fluid powered downhole motor 14 with a bend for rotating a bit”* it is therefore not the casing string with the bend but the motor. Claim 8 recites the limitation of a casing string having a bend, this is not taught by Chen et al.

Claims 9, 11, 12 and 13 are dependent upon claim 8 and therefore incorporate the limitations of that claim. Claims 9, 11, 12 and 13 are thus distinguishable over Chen et al for at least the reasons given in the paragraphs relating to claim 8 above.

Claim 14 of the current application recites: a method of directional drilling comprising rotating a casing string at a first speed that is slower than an optimum drilling speed; and

operating a mud motor to rotate a drill bit at a second speed; and changing the direction of the drill bit by operating a rotary steerable system. Chen et al does not teach the limitations of claim 14.

The office action suggests that the drilling string is rotated at a first speed. Chen et al does disclose the rotation of the drillstring. However it is neither disclosed nor suggested that the speed is slower than an optimum drilling speed it is merely disclosed that it is desirable to rotate the drillstring. Column 3, line 16. For at least this reason therefore claim 14 is distinguishable over Chen et al.

Claim 15 of the current application is dependent upon claim 14 and the applicant therefore submits that it is distinguishable over Chen et al for at least the reasons given in the paragraph relating to claim 14 above.

Claim 18 of the current application recites the limitation of providing a method of directional casing drilling, comprising: positioning a casing string so that a bend in a lower section of the casing string points in a desired azimuthal direction; and engaging a mud motor to rotate a drill bit. Chen et al does not disclose nor suggest that there is a bend present in the lower section of the casing string; it teaches that the bend is in the mud motor. Therefore Chen et al fails to teach the limitations of Claim 18 of the current invention and is distinguishable for at least this reason.

Claim Rejections 35 U.S.C. § 103

Claim 10 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hahn et al. in view of Parant (US 4,842,081) and Chen in view of Parant. This rejection is respectfully

traversed. Applicant submits that the Examiner has failed to establish a prima facie case of obviousness.

Claim 10 is dependent on claim 8 and therefore, in effect, recites: A directional casing drilling system comprising: a casing string having an integral bend proximate a lower end of the casing string; with a mud motor operatively coupled to the casing string; and having a drill bit operatively coupled to the mud motor wherein the mud motor is disposed inside the lower end of the casing string.

As stated above the Office Action suggests that Hahn teaches a mud motor 149 operatively coupled to a casing string 112 whereas, although 112 is indeed a casing, it is merely provided at an upper portion of the wellbore 110 and is separated from the mud motor by a lower section 114, the lower section 114 is of a smaller diameter than the casing 112. The casing can therefore not be said to operatively coupled to the mud motor, it is, in fact, separated by, up to, many thousands of feet of lower section 114. (See column 3 lines 1 to 5 of Hahn et al) Therefore, Hahn et al fails to provide any disclosure of Claim 10 of the current invention and is distinguishable for at least this reason. Further Parant relates to the field of horizontal or vertical drilling whereas Hahn relates to steerable or controlled directional drilling. The field of horizontal or vertical drilling does not require a steerable system to be provided. One skilled in the art to which the invention relates would therefore not look to the field of horizontal or vertical, that is, non-controlled or directional drilling with any expectation of success in finding any design solutions. There is no motivation to combine the cited references.

Moreover, one of skill in the art would not be motivated to combine the apparatus of Hahn with a non-controlled or directional tool, such as the drill tool described by Parant. In fact,

such a combination would destroy the function of Hahn et al and ignore those portions of Hahn et al that teach away from such a combination. See Column 5 lines 1 to 21 in which controlled or directional drilling is described. The proposed combination set forth in the Office Action uses improper hindsight reconstruction, selective dissection and unsupported assumptions in an attempt to generate Applicant's claimed invention.

There is also no motivation to combine Parant with Chen to achieve Applicant's invention. Parant relates to the field of horizontal or vertical drilling whereas Chen et al. relates to steerable or controlled directional drilling. The field of horizontal or vertical drilling does not require a steerable system to be provided. One skilled in the art to which the invention relates would therefore not look to the field of horizontal or vertical, that is, non-controlled or non-directional drilling with any expectation of success in finding any design solutions. Thus, there is no motivation to combine the cited references. One of skill in the art would not be motivated to combine the apparatus of Chen et al with a non-directional tool, such as the drill tool described by Parant. The proposed combination set forth in the Office Action uses improper hindsight reconstruction, selective dissection and unsupported assumptions in an attempt to generate Applicant's claimed invention.

For at least these reasons, Applicant submits that the Examiner has failed to establish a prima facie case of obviousness under 35 U.S.C. § 103 (a) based on the cited art alone or in combination. Applicant, therefore, respectfully requests withdrawal of the rejection of the claims under 35 U.S.C. § 103.

Appl. No. 10/735,323
Amd. Dated December 8, 2005
Reply to Office Action Dated July 26th, 2005

Double Patenting

Claims 1-4, 6, 7, and 14 stand rejected under the judicially created doctrine of obvious-type double patenting as being unpatentable over claims 1-13 of co pending application 10/735,312. The office action refers to this application as standing in the name of Hahn et al. However, this co-pending application is in fact commonly owned with this application and in fact is in the name of Moriarty. The applicant submits herewith a terminal disclaimer in compliance with 37 CFR 1.321(c) and submits that this rejection is hereby obviated.

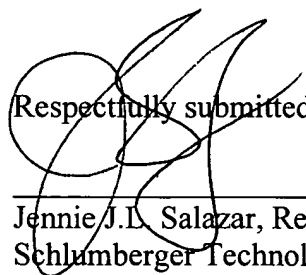
Applicant respectfully requests that a timely Notice of Allowance be issued in this case. Applicant believes this reply to be fully responsive to all outstanding issues and place this application in condition for allowance. If this belief is incorrect, or other issues arise, do not hesitate to contact the undersigned at the telephone number listed below.

This paper is submitted in response to the Office Action dated July 26, 2005 for which the three-month date for response is October 26th 2005. A request for a two (2) month extension of the time to respond to the Official Action is hereby made, bringing the date for response to December 26th, 2005. Please apply any charges not covered, such as the two-month extension fee and terminal disclaimer fee, or any credits, to Deposit Account 50-2898 (Reference Number 92.1048).

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Date: 12/8/05

Respectfully submitted,



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Attachments:

1. Replacement Sheet 3 including Figure 2B;
2. Version with Markings to Show Changes Made to Figure 2B;
3. Information Disclosure Statement with 8 non-US References attached; and
4. A Terminal Disclaimer.

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Amendments to the Drawings:

The attached sheet 3 of the drawings includes changes to Fig. 2B. This sheet, which includes Figs. 2A and 2B as well, replaces the original sheet 3 including Figs. 2A, 2B and 2C. In Fig. 2B, the reference numeral 215 has been replaced by 205. No new matter is added by this amendment.

Attachment: Replacement Drawing Sheet 3 showing amended Figure 2B

Annotated Sheet 3 Showing Changes to Figure 2B in Redline.

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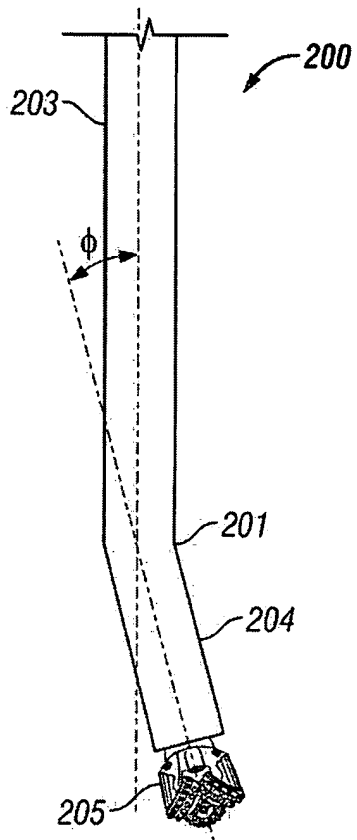


FIG. 2A
(Prior Art)

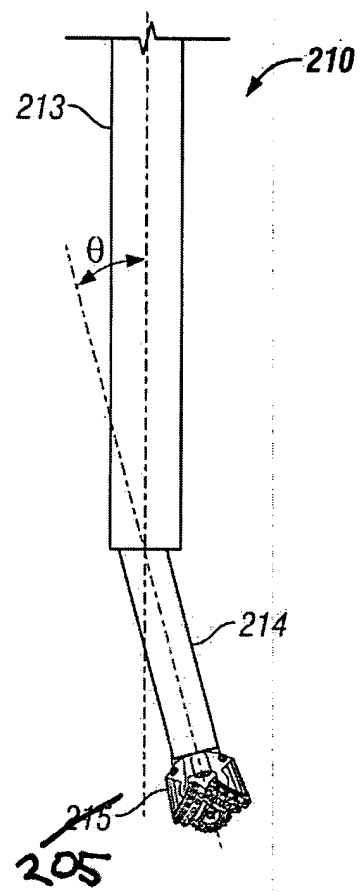


FIG. 2B
(Prior Art)

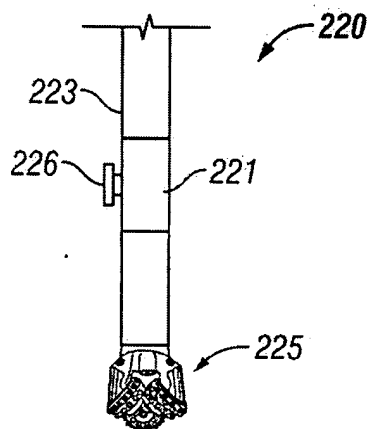


FIG. 2C
(Prior Art)